DEPARTMENT OF COMPUTER SCIENCE ENGINEERING,
SCHOOL OF ENGINEERING AND TECHNOLOGY,
SHARDA UNIVERSITY, GREATER NOIDA

ANDROID APPLICATION FOR IMPROVING AND EASING HUMAN'S LIFESTYLE

A project submitted
in partial fulfillment of the requirements for the degree of
Bachelor of Technology in Computer Science and Engineering

by

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CERTIFICATE

This is to certify that the report entitled '**Android application for improving and easing human's lifestyle**' submitted by Mr.Divyansh Arun (180102006), Mr.Karun Sahani (180102012), Mr.Ansh Gangwar (180102004), Mr.Samrat Borah (180102025) to Sharda University, towards the fulfillment of requirements of the degree of **Bachelor of Technology** is record of bonafide final year Project work carried out by her in the Department of Computer Science and Engineering, School of Engineering and Technology, Sharda University.

The results/findings contained in this Project have not been submitted in part or full to any other University/Institute for award of any other Degree/Diploma.

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Date:

Signature of External Examiner

Date:

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Abstract

Nowadays the core and fundamentals is weakened and is lacking especially in the youth. Primarily focusing on the youth's lifestyle, 'Being Human' is an android application which will help users in easing, improving and enhancing their lifestyle.This is an AI(Artificial Intelligence) based app. In this busy and hectic life we all need something to hold our details, to keep reminding us for our daily essentials and need. From health to relationship, this app is like your virtual personal manager, enhancing your lifestyle with a touch of artificial intelligence. The features of the application makes it an unique application as summing up the features it's like an all in one application having features of more than ten applications into a single application.

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Chapter1: INTRODUCTION

‘Being a human’ application will be providing a lot of helpful features which will help users in easing and improving their lifestyle. In the application it will take few information from the user at the time of sign up. The application will take name, gender and date of birth information. After that the application will show the list of features the application is providing. For using any specific feature of the application, the user may need to give some more information which will be saved in the application’s database.

Talking about the features of the application, the first feature of the application is that, it will tell us the days on which we don’t prefer eating non-vegetarian foods, at the time of using this feature, for the first time you’ll need to enter the days on which we don’t eat non-vegetarian foods and in the application’s homepage it will show us a red cross icon if we’re not supposed to eat the food on that day or a green tick icon if we can eat that day with a proper graphical user interface, also in non vegetarian edible day, the application will show us the best restaurants nearby. The same will happen with hair cutting and beard trimming option, as an input the application will ask for the days on which the user don’t prefer going to salon, and on the salon day, nearby salons with direction will be shown to the user. Also the user can add the last date he/she went to salon just for future reference. The second feature of this application will find out and tell us that you should wash and dry your clothes or not, for this the application will find out our location’s weather and by using artificial intelligence it will warn us if the weather is not suitable for drying our clothes. The prediction and suggestion for washing our clothes or not will be calculated on the basis of temperature[16], wind speed, humidity, chances of rain and moisture percentage. For female users, the application offers a feature named ‘Periods Tracker’ which will keep record of their menstrual cycle[8], in which they’ll need to select the days of the month they experience the menstrual cycle. Also it will show how many days left in next cycle and it will warn if the period is delayed to the user[8].

‘Being a human’ application will keep a record of ‘what’s in your fridge’ too?, where the user will have to enter the vegetables, beverages, dairy products they’re having in the fridge, and by using the items added in the application, the application will suggest some dishes/ recipes along with the preparation method using the same ingredients which are available in the

refrigerator. The application is offering us a virtual wardrobe where the user will have to add pictures of the clothes[13] and using artificial intelligence it will suggest combinations of outfits every day to the user following the recommended color for different days of a week[5] and the best matching outfit combinations and it will make it easier for the user to choose outfit of the day[15], also the user can set if any cloth is in laundry, so it won't suggest that cloth. The application has a built in to-do list where the user can add things which they're planning to do in their daily/weekly or monthly routine and the user can check them with tick once it's done. This application can also be used for managing our routine and also it will remind us our important meals/ supplements/ medications of our diet on the time we set it to. For our relationship management, the application will help us being connected with our relatives and friends as we'll need to select the day of a week on which it will remind us to talk to our relatives and friends, all we'll need to do is to select some favourite contacts by picking it from our contact list. The application can also hold our workout and exercise plans and also it will have a fact section where everyday new interesting fun facts will be pushed. The application will have an 'expense management' section where the user can add their daily expenses and at the end of the month they can see the total money they spent in that month with proper analytics[11]. Water is the most essential fuel for us and in a government study it has been found that 40% of Americans drink less water than their daily requirement[1], which further becomes primary reason for kidney malfunction and many more diseases, so taking care of the user's water intake if the user enables the settings the application will keep reminding the user to drink water at regular intervals so the user will fulfill the adequate intake of water.

People are too much occupied these days in their day to day life and they miss some important activities from their lifestyle[2], also the youth these days has adapted a lifestyle which is affecting their growth and mental health in long term[14]. Also the youth are missing their ethics which should be followed. The purpose of this application is to be an one click place where they're having their own analytics which will help remembering the things which they forget in their busy life. The main motivation for this application is just enhancing our lifestyle and also making lifestyle pretty easy with just few clicks into the application. A good lifestyle is very important for being mentally and health wise fit and that's the primary goal of the application.

In earlier times, the main purpose of clothes was to protect our body from environmental factors and cold/hot weather, but now clothes are main source of your fashion representation. Also our outfit says a lot about our personality[9]. The proposed system aiming to ensure minimal, optimized, android application with responsive and user friendly interface which will help users in many ways. The application ' s virtual wardrobe also offers an outfit recommender[15], we can have a complete access to this virtual wardrobe so we can see all the clothes we're having in our wardrobe. The application's algorithm is trained in a way that it follows latest fashion trends for suggesting us the best combos and outfits.

1.1 Problem Definition

People nowadays are missing some important measurement, tracking and activities from their life due to busy and hectic lifestyle which is affecting them mentally, emotionally and health-wise. ‘Being a human’ application is designed in a way that it acts like a virtual personal assistant and manager of the user. The application helps in holding person’s analytics and data as user can make their virtual wardrobe, virtual fridge manager, money/ expense tracker, female users can track their menstrual cycle records, to do list, medicines/ supplements routine as well as water intake of the user. Till now for using such features user needed more than ten different application which use to rush user’s phone and storage and because of this users weren’t able to use any of the application properly. Apart from this some features like virtual wardrobe, what’s in my fridge and called your loved ones are unique features and till now no such application exists which offer such features. Overall, this application is designed to solve some lifestyle problems which can help them improving, easing and enhancing their lifestyle just with few clicks into the application.

- Also the application’s inbuilt AI helps you in suggesting outfits of the day from your wardrobe and recipes which you can make from the items/ ingredients present in your fridge. This suggestions generated by the application can help the user making a better decision and reducing his/her confusion of making a choice.

- Tracking menstrual cycle for women are very important and even at the time of diagnosis, doctors always ask for the menstrual cycle logs and this application allows the female user to make menstrual cycle based analytics properly which can be tracked anytime and the application also predicts the upcoming period cycle date and warns you if period is delayed.

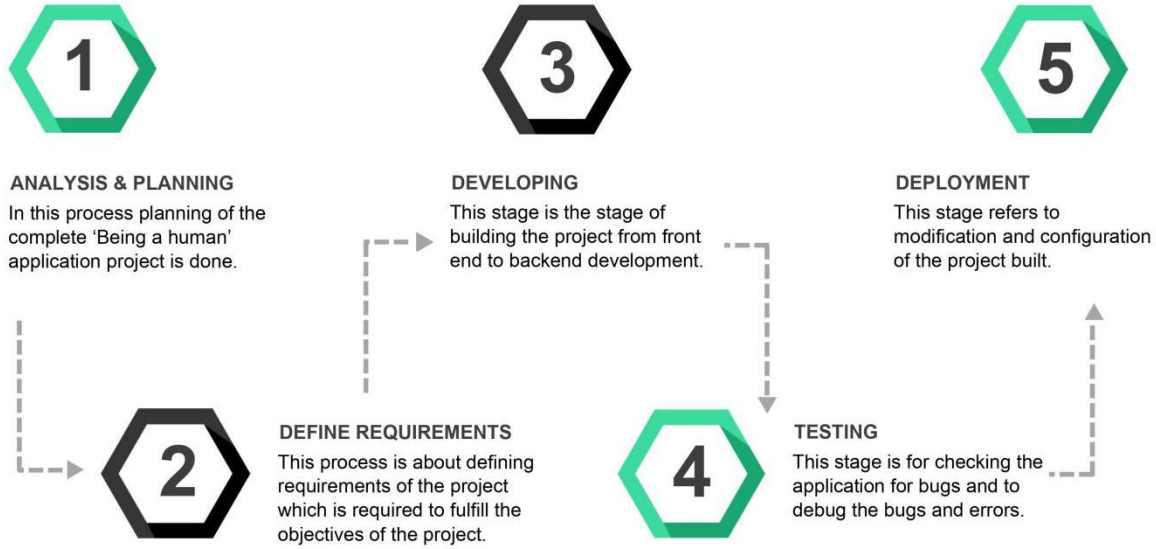

Fig-1 Application Development Process

Software development cycle begins with the first process of analysis and planning. In the first stage which is analysis and planning we find the use of the data we collect, and the way how it will be analyzed. It helps in finding the most appropriate research methodologies. Also the blueprint of the proposal is developed along with the flowchart of works. In the second stage the software and hardware requirement are defined for the development of software. After this, in the developing stage the app development part is done in which the algorithm, coding part of the application is done along with connecting the back-end with the front-end of the application. Once the development part is done, testing and debugging of the application is done in which the app is tested for different parameters using different testing methods and also the bugs are fixed. The last process of this cycle is to deploy the developed app so users can download and use the application.

1.2 Project Overview/ Requirement Specifications

1. Laundry check will help users finding that they should wash and dry their clothes or not by using the location's weather.

2. The application will also have your virtual wardrobe where user will have to add pictures of the clothes and using artificial intelligence it will suggest combinations of outfits every day to the user (matching colors / formal / informal dresses). Also the user can set if any cloth is in laundry, so it won't suggest that.

3. User can set the days in which they don't eat non vegetarian foods and the days on which they don't have to get their hair cut or beard trim.

4. For female users, it will also include the record of their menstrual cycle. In which they'll need to select the days of the month when they experience menstrual cycle, so they can monitor and track anytime about their cycle and important dates.

5. This application will have your daily routine and also it will remind you some important meals / supplements/ medications of your diet.

6. You can use this application to note down your daily goals by adding all activities in the to-do list section.

7. This application can also be used for reminding things. You can set reminder of some specific task, which will be reminded through notifications.

8. You can set any specific day of a week or maybe the weekends when the app will remind you to talk to your relatives to be in touch with them.

9. Users can make a proper workout routine and also it will send user's notifications to go on walk or to take their dog on walk.

10. This application will also have a fact section in the bottom of the screen where everyday

new interesting fun facts will be pushed.

11. The application will keep reminding you at regular intervals to drink water by sending notifications, so the user will get adequate intake of water.

12. In daily expense section, users can add their daily expenses and in the end of the month they can see the total money they spent in the month with proper analytics.

1.3Hardware Specification

Hardware name	Purpose
64 bit chip set	Required for latest android version
SSD or HDD	Storage to install android studio and supporting files.
4 GB RAM	At least 4gb of ram is important for running the AVD smoothly
Android phones	For testing application on different aspect ratio devices for checking the responsiveness of the application

Table 1.3.1 : Hardware Requirements

This table is about the hardware requirements and their specifications which is required for fulfilling the objective of this project. The minimum requirement of hardware specification of the system is given in the above table.

1.4Software Specifications

SOFTWARE NAME	PURPOSE	MINIMUM REQUIREMENTS
Android studio 4.1.3	App development	1.) Microsoft windows operating system 2.) 3 GB RAM at least 3.) minimum 2 gigabyte of free disk space 4.) 500 MB space for IDE 5.) 1280 x 800 minimum resolution of screen.
Adobe illustrator 25.4. 1	Graphic designing front end UI elements designing	1.) Intel pentium /AMD 64 bit processor 2.) Microsoft windows operating system 3.) At least 1 gigabyte of ram , 4.) .2 GB storage for installation
Android virtual device pixel xl 29 API	Running application in real time with modified changes, without rendering the APK	1.) Microsoft windows operating system 2.) 3 GB RAM at least 3.) Graphics drivers or windows directx 11+ 4.) minimum 2 GB of HDD free space. 5.) Multi core processor for AVD
Google firebase online latest version	Monitoring app analytics & for pushing notifications to the user	I. Firebase CLI v9.9.0.
Java software Development kit	For developing, debugging, and monitoring java applications.	1.) Microsoft windows operating system 2.) 3 GB RAM at least 3.) Minimum 2 GB of free disk space 4.) 500 megabytes for IDE 5.)1280 x 800 minimum resolution of screen

Chapter2: Literature Survey

Outfit recommender based on colors is constructing a productive style suggestion every day for different outfits by taking care of the latest trend and combinations which will be liked by people of different taste is a typical framework with a high multifaceted nature[5]. Previously research works on such fashion recommendation system is done[5], but since the success of this system is a subject of matter which depends from person to person, it's not widely accepted. An olive t-shirt with beige trouser can be liked by someone but on the other hand maybe some people would not like it. The paper proposes about the different tastes of people in apparels, but this application just make suggestions from what you're having in your wardrobe, just your clothes. Despite showing suggestions of random clothing, it's just your own virtual wardrobe where you'll have complete collection of your own clothes. The random suggestions also lead to product unavailability and hence the users are unable to find same or similar looking outfits. Also according to *vaastu shashtra* and *feng shui,* particular colors are prescribed to wear on different days of a week, which helps in your good luck, health, wealth and prosperity[5]. Coming to the identification process of colors of added clothes. The first step of the outfit recommender is based on fetching color of the added outfit. The system picks the color which is widely used in an outfit, like if there's a black shirt with white patterns in it, then the system will pick the black color as it is majorly used in the cloth[12]. The system is designed in a way in which it scans for the base color and various different shades of that colors are associated with that base colors as it is not possible to add 16 millions color code, so gradient pallet is used for selecting range of colors[15]. The color picking algorithm is implemented in a way that it adjusts the exposure of the clicked picture of the cloth so it can scan for the actual color, as colors differ in different lighting condition[12].

Coming to the weather analysis and prediction, this android application can take permission of location only but by using that location the weather can be determined. Since smart-phones don't have any temperature sensor, the weather can only be identified by using any weather API along with GPS access[16]. The paper proposes the ideal temperature and weather type suitable for drying clothes. Temperature, weather type and humidity all are proportional to this system. Different parameters is used for different weather type like overcast, sunny, rainy along with temperature range. The system helps in evaluating the real time weather scenarios

and recommend suggestion for drying clothes according to the weather[16]. Now, the virtual refrigerator and wardrobe management system is managing your refrigerator items on your phone is very helpful as if you're at a shop you'll know about what things you're having in your fridge already and what you've to buy. This virtual refrigerator management system needs to be updated every time you add or remove something from your fridge[13]. The best part of this implementation is that it also suggests you different recipes based on the items you're having in your fridge. The menu for adding and removing items is categorized from dairy products to vegetables and different recipes along with the tutorial, the recipe is added into the application's database and more recipes can be added by the backend anytime. Coming to the virtual wardrobe is like your own digital wardrobe in which you can scan and add all the clothes you're having into your wardrobe[13] and this is one time process after that you can virtually look into your clothes, also it comes with an option of day wise outfit recommender[15]. Also ensuring adequate/ recommended water intake. As mentioned earlier in this paper, in a survey of 'Centers for Disease Control and Prevention'. It has been found that 40% of Americans drink less than four cups of water a day[1]. That includes 36 percent who drink one to three cups, and 7 percent who drink none[1], which causes a lot of problems in long term from slow metabolism to severe kidney dysfunctions. Adding water before meals helps you eat less if we are making an attempt to slim. This paper presents us with the causes of drinking less water[1], and coming to a solution for those who drink less water than their daily requirement, the paper proposes to drink a small amount of water in regular interval of time. It is not important to drink 2 glass back to back, but you can split it into half glass every half an hour and by this you will consume 2 glasses of water in 2 hours and so on. The water reminder section of the application is designed in this way only, so it will keep on reminding the user by sending notifications[14]. The procrastination measurement and procrastination problem with youth is affecting the growth of students in many ways. In a study it is found that procrastination affects 70% of students[2], and around 25% adults prefer procrastination to be a character trait for them. [2] The paper proposes us with the impact of procrastination and how youth is growing in unproductive approach.[14] The implementation into the system is done in a way that it makes things easy and organized digitally for users so the primary reason for their procrastination habit is into the application on some finger tips, also this paper proposes that reminding again and again about the activity a person is procrastinating, it leads the person to complete it.[2]

It is found that females are not monitoring their menstrual cycle. After the age of puberty, a lot of women experience irregular menstrual cycle. However, according to doctors and physicians, it's normal for the menstrual cycle to vary by some days. According to American Academy of Family Physicians, between 9 to 14% of women have irregular periods between their first period and menopause[3], but on the other hand it is very important to track their periods so at the time of diagnosis a proper analytics will be helpful for doctors[8]. The paper presents us that a woman should have a proper logs of her menstrual cycle including number of days periods is delayed by[8]. The youth lacking in their expense tracking too. Tracking and monitoring our expenses in one of the main factor for planning our budget[4]. If we know how much we've spent every month, it will be very easy planning our expenses, saving and investments. In a survey of American college, only 13% of people track their monthly expenses[4]. Also the paper proposes that tracking your expenses helps you in saving money indirectly and it is important for youth who get pocket money to even a salaried person. The application comes with an expense tracker section where a user can note down their expenses with proper description and categories[11].

2.1 Existing System

Artificial Intelligence and machine learning is being used for colour identification for colour blind people and also this technique is used for detecting skin colours. Also this is used in object detection as the algorithm scans for the shape, size as well as the colour for finding relevant results. For now this technology is used in very limited scale[12]. Colour identification algorithms identifies pixels of an image and then it matches the specified colour from colour range, later the pixel is distinguished from the colours available in the colour range. Since programming languages doesn't work with name of colour as there are 16 million colours, we need hex code of colours. Colour ranges are like colour gradient pallets which contains different shades of a particular colour. Till now this technology Is being used by processing the image, which means real time colour detection along with hex code wasn't available till date as training an AI system for 16 million colours is not an easy job. Also colour identification methodology is used by online diagnosis systems as the system identifies the type of wound, pimples and acne by scanning for the colour intensity of the wound. Till now outfit recommendation systems are based on the best outfits available online and fashion suggestions from some inspiring models[10]. No outfit recommendation system was made for your own clothes which you're having in your wardrobe. Features such as Periods tracker, water reminder and to-do list existed but user needed to download different apps for these purpose, no all in one application existed.

2.2 Proposed System

Virtual wardrobe is an important feature of ‘Being a human app’ and this feature is based on artificial intelligence. Virtual wardrobe is like a smart digital wardrobe of yours where you can browse all the closets available in your wardrobe, also the user can mark a cloth if it is in laundry. Inside the virtual wardrobe, user get an outfit recommendation system which suggest outfits to the user day wise based on the recommended colours given by ‘Vastu Shashtra and Feng Shui’ which is world wide accepted. According to the principles of Vastu Shashtra different colours are recommended to wear on different day which leads to a healthy, prosperous and happy life along with good luck. In virtual wardrobe, users can add clothes by the inbuilt camera of the app which comes with a real time colour identification scanner, as soon as the shutter button is clicked the hex code is trapped and the outfit is saved with the colour code name in the backend which is later used by recommendation system. Here the algorithm for colour identification is not based on processing the image after capturing it, but instead to capture the colour code in real time as it leads to more accurate result. The captured hex code is matched with the colour range for achieving the base colour. In case if the user is not having the colour which is recommended for that day, the application suggest random outfits with a message that “since you don’t have any red colour outfit, here’s what you can try”. ‘Being a human’ app is an all in one application as the user don’t need to download multiple apps for different purpose. The outfit recommendation system of this app is based on your own closets which you’re having in your wardrobe. Also the fridge management section of this app comes with an interesting feature which suggest recipes to the user based on the ingredients the user is having into the refrigerator. Colour identification technique in the inbuilt camera is not based on pixel distinguishing method, the pointer present in the inbuilt camera scans the area for colour and in case of multiple coloured outfits, the majorly used colour is detected for better accuracy.

2.3 Feasibility Study

Financial Feasibility :

Ads can be implemented into the application like amazon ads or Google Admob which can be used for revenue generation in this application by receiving traffic and clicks. Apart from it monthly/ quarterly and annual subscriptions can be offered to the user. One of the application's feature (Laundry Check Feature) based on weather uses API of accuweather weather's API which charges $25 every month for using it's API. In the non-vegetarian day section, the application suggests some good restaurants nearby to the user with direction so in this the app uses API of Google maps which is free for limited usage, but after it it charges certain amount for getting the API signature key. Apart from it the server based notification pushing in our app, will need connection from platforms like One Signal or Google Firebase which will charge certain amount for monthly/quarterly or annual subscription.

Technical & Resource Feasibility :

The main technologies associated with this project is based on Java and the resources are programming device (laptop), programming tools (Freely Available : Android Studio), graphic designing tools (adobe illustrator), non - copyrighted free to use icons and animations. Resources are collected from internet for the research purpose.

Time Feasibility :

The time period provided for the project is according to the total time needed for complete development and testing of the mobile app. This is around ten month project, it will have several deadlines and deliverables that will be scheduled successively. In between, multiple evaluation of the project will be done in which the progress of the application needs to be shown. The development of the complete project is well planned and no delays will result in timely completion of this project. Also the research paper of the project needs to be published and the reviewing time is also a factor of this feasibility.

2.4 Risk Management

Project objectives and need is not well defined with strong arguments, also the design of the project along with deliverable definition is not completed. The biggest risk of this project is stealing of the concept of this project and theft of algorithm of colour identification, as it comes with some unique idea and plannings, be it virtual wardrobe, virtual refrigerator management system, outfit recommendation system or be it the idea to make an all in one application. Wrong time estimation and unavailability of resources of dataset were another risk which impacted the development process of this application. Different risks are mitigated differently which is given in the below table.

Table 2.4.1: Risk management and classification

Type of Risk	Severity	Mitigating Action
Project objectives and needs are not well defined, deliverable definition are not clear.	Medium	Ensuring the purposes of this app in related documents and doing some changes in the app features and user interface for making it more interesting.
Theft of Concept	High	We made sure not to upload any project based document in public, keeping care of the privacy until research paper is not published and the development work is not finished.
Theft of Algorithm	High	The colour identification algorithm is the main element of this project, the development tools and devices are well encrypted with security softwares and password protected for provoking unauthorised access.
Wrong time estimation	Low	Predicting the development time of different element of the project is never up to estimations, overtime working made progress better.

The above table 2.4.1 is a classification of risk along with its types, severity of the risk, mitigating actions to be performed for the risk. Risk can arrive anytime into any project and for that reason it is very important to be prepared for risk. Some of the common risk are concept stealing or it is also known as ‘theft of concept’, theft of algorithm and wrong time estimation of the project. Severity of risk varies from low to very high in different types of risks.

Chapter 3: System Analysis and Design

3.1 Software Requirement Specification

3.1.1 Product Perspective

In view of the functions of this application, the perspective is to ease, improve and enhance human's lifestyle. The application is designed in a way that it becomes virtual personal assistant of the user. The application is small in size in comparison with other applications with same feature and also it works smoothly even on low end devices.

3.1.2 Product Functions

Being a human application functions include virtual wardrobe, fridge manager, outfit recommender, female periods tracker, water reminder, expense tracker and a lot more. The application becomes handy as features of several application is found within a single application. Important features of the applications are Virtual wardrobe, what's in my fridge, weather based laundry check and outfit recommendation system .

List of all the features :

1) Virtual wardrobe and outfit recommendation system
2) Weather based laundry checker
3) What's in my fridge ? (Fridge manager)
4) Vegetarian/Non Vegetarian Day
5) Nearby Salon/ Restaurant Finder
6) Water Intake Reminder
7) Routine Organizer
8) Period's tracker
9) Expense Manager
10) Called your loved ones
11) To-do list

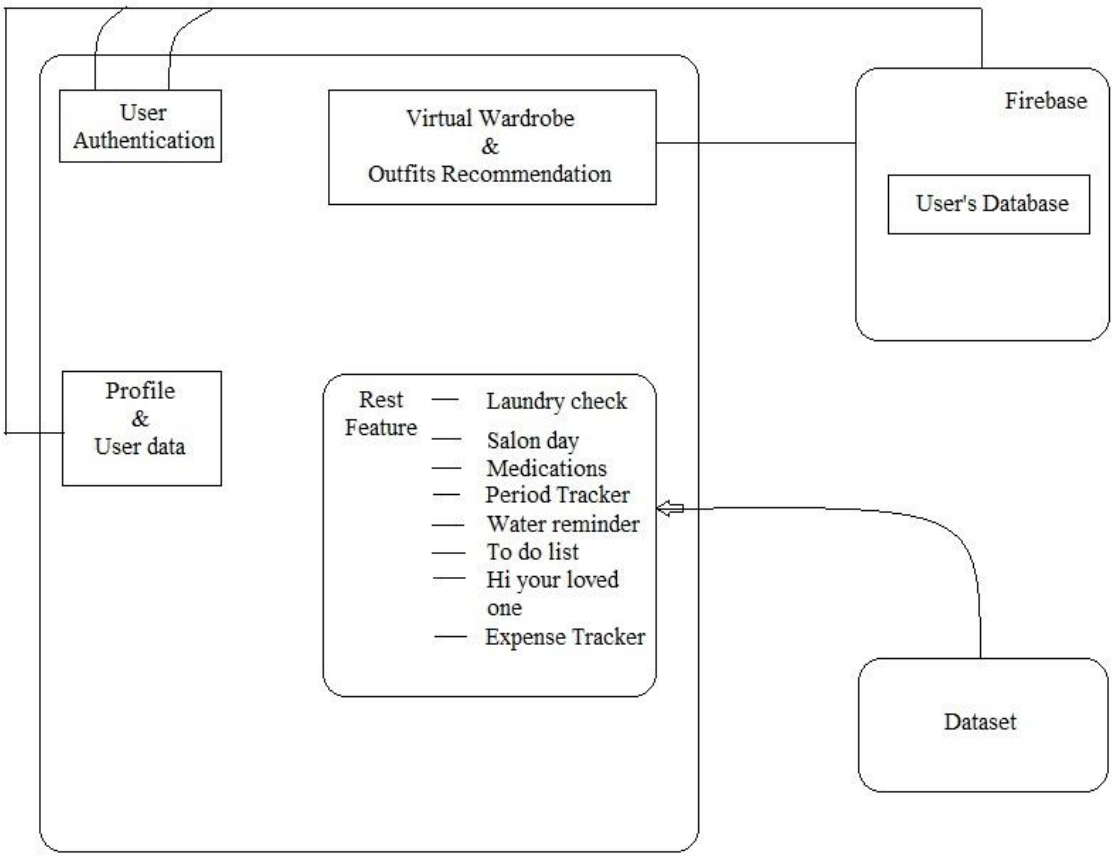

Fig 2 -System architecture of application

The application is based on three main components which uses artificial intelligence and particular data set for individual feature. Virtual wardrobe and outfit recommender is based on artificial intelligence as the application's inbuilt camera scans for the color present in cloth along with the color code by which it makes decision in outfit recommender section. User can create multiple drawers and can add different outfits.

1.) User authentication is the initial step which is the login/ sign up part of the application. User can login directly by Google account as authentication is linked by Google Firebase. User's data such as name, age, avatar picture will be taken from Google account and also application based user's data will be linked with the account. User can remove his/her data from the Google account whenever they wish to, and can logout anytime too.

2.) Virtual wardrobe and outfit recommendation system is the main feature of this application and in this the user can create a drawer, within that drawer the user can add several outfits. Outfits can be added by clicking picture of the outfit using the application's in built camera, the camera is trained in a way that it scans for the color in real time along with the hex code. Color code is picked as soon the shutter button of camera is pressed, then the algorithm calls the hex code and the algorithm returns the color name then the image of the outfit is saved with the color name. The hex code finds the base color and then day wise recommendation is done by the application. The AI of the application scans the colors and on the basis of color suggested day-wise by Vastu Shashtra it suggests the upper body outfit and the lower body outfit is recommended according to the intensity of upper body outfit suggested. Generally dark colors is paired with light color upper body outfit and vice-versa. The color picker is based on real time as it keeps scanning the color and with the shutter button press, it traps and save the hex code in the back end, which is later used for recommendation system.

3.) Profile is the user's account page which contains user's data and option to logout. The data is retrieved from Firebase and name, gender, profile picture, age is taken from Google account access.

Days	**Colors Preferred**	**Base Color**	**RGB Code**
Monday	white	Floral White	#FFFAF0
Tuesday	red	Indian Red	#CD5C5C
Wednesday	green	Lime Green	#32CD32
Thursday	yellow	Light Yellow	#FFFFE0
Friday	light blue/white	Alice Blue	#F0F8FF
Saturday	purple/black	RebeccaPurple	#663399
Sunday	pink/maroon	Maroon	#800000

Table 3.1.1 List of base colors along with hex code

The above table 3.1.1 explains the base color recommended for different days based on the virtual wardrobe's outfit recommendation system. Every base color and its hex code is used for finding the relevant result.

4.) Rest features are linked with the data set as different conditions are set for different features, like different parameters are set for different temperature and weather conditions. Same with 'What's in my fridge' section, as the data set of recipe is shown if the condition matches as the ingredients should be present in the fridge. The user can add and remove ingredients with just single click.

5.) Database of the application contains the images of outfits of the user added in the virtual wardrobe, ingredients of fridge are updated in database, vegetarian/non vegetarian and salon day's data, to-do list data, periods log all are stored in the application's database which is synced with the Google account. Images are stored locally and synced later on Firebase, as calling images from server makes the application slow.

3.1.2.1 Proposed Methodology

The algorithm used in the AI part of the application is a self designed algorithm and it is designed basically for fetching the colour from the cloth. But this identification process is not only limited to finding the colour but it also finds the exact hex code of the matching colour. Since making an algorithm of 16 million colours was not possible so we first made our colour pallets by categorizing different colour gradients. Colour gradients are basically different tone of a single colour from it's light tone to darkest tone. These colour gradients training allows in comparing the fetched hex code with base colours as the result should be categorized into sever colours only. This exact hex code fetching makes the application in making highly accurate outputs in comparison with any other color identification algorithm. So for identification process the application comes with it's inbuilt camera which is trained with this real time hex code scanning feature. The central part of the camera grids crops a radius from the cloth and then the cropped pixel is compared with the colour gradient and it's RGB value is achieved. Then the hex code is compared with the base colour and the fetched RGB code along with the base colour is saved in the application's backend for making future suggestions.

3.1.3 User Characteristics

3.1.3.1 Large Organizations

When fully developed, this application can be distributed and promoted to use by art of living schools and also within several communities to make sure, that they are having a healthy lifestyle.

3.1.3.2 Academic Organizations

In order to teach importance of money and it's tracking this application can be used by students for monitoring their expenses. Also importance of hygiene and tracking of menstrual cycle should be taught to female students.

3.1.4 Design and Implementation Constraints

3.1.4.1 Standards Compliance

The application follows all the guidelines of Google Play Store, so it can be published easily on the play store without violating any guidelines. Also the application is rated to be used by people with age of more than 13. Also the application does not transmit or backup your data anywhere. Your data is only synced with your Google account.

3.1.5 Assumptions and Dependencies

• Internet connection is needed for using some features of the application.
• Phone's camera should be of good quality and good lighting condition is important, as poor lighting can pick wrong color codes and hence can show inadequate suggestions and recommendations.

3.1.6 Requirement Specification

3.1.6.1 User Interfaces

The user interface of the application is designed in a way that it becomes easy and interesting to the user. The application's home consist of all the features and the application is made in one screen. The application is designed in a way that it is responsive to different android versions and aspect ratios of different phones. The app comes with a splash screen and at first time usage after installation, it gives you a quick tutorial of the application and highlight the main features of the application.

UI Graphics

The graphics used within the application are created using adobe illustrator and sketch. Also some in application's animations are loyalty free animations from lotto animations. Logo, splash screen, buttons are created using adobe illustrator software.

3.1.6.2 Hardware Interfaces

A good camera is needed so the virtual wardrobe feature along with outfit recommender will work fine, bad quality of camera can lead to inaccuracy in the hex code detection which will lead to incorrect recommendations. Apart from it GPS of your phone is used for detecting the location and weather reports accordingly. Also a precise GPS is important for viewing nearby salons and restaurants.

3.1.6.3 Software Interfaces

• There's no admin application, facts can be updated from the live server of OneSignal.
• Google firebase is integrated for syncing the user's account and for pushing custom notifications to the user.

3.2 Flowchart & DFD

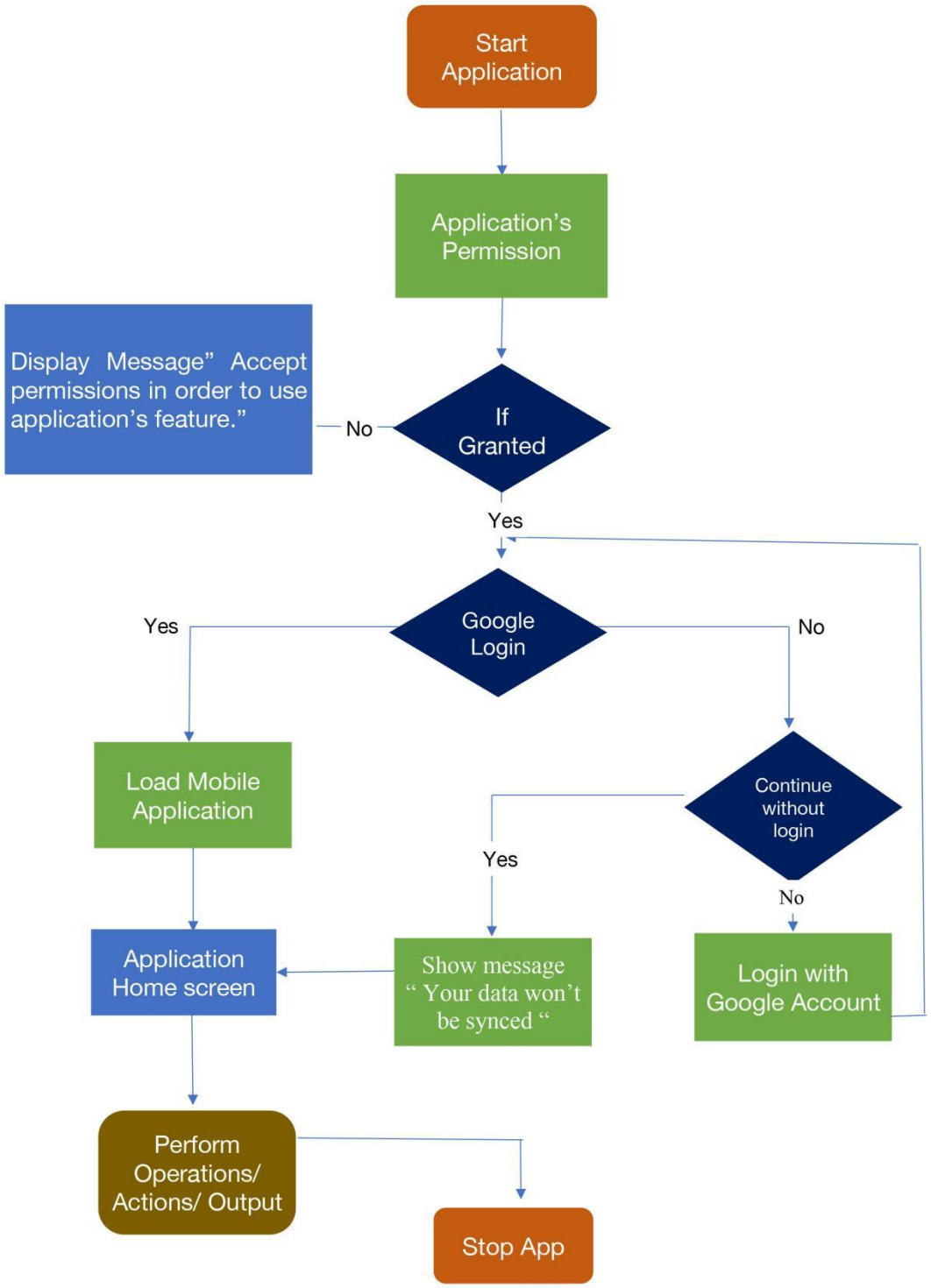

Fig 3 : Flowchart

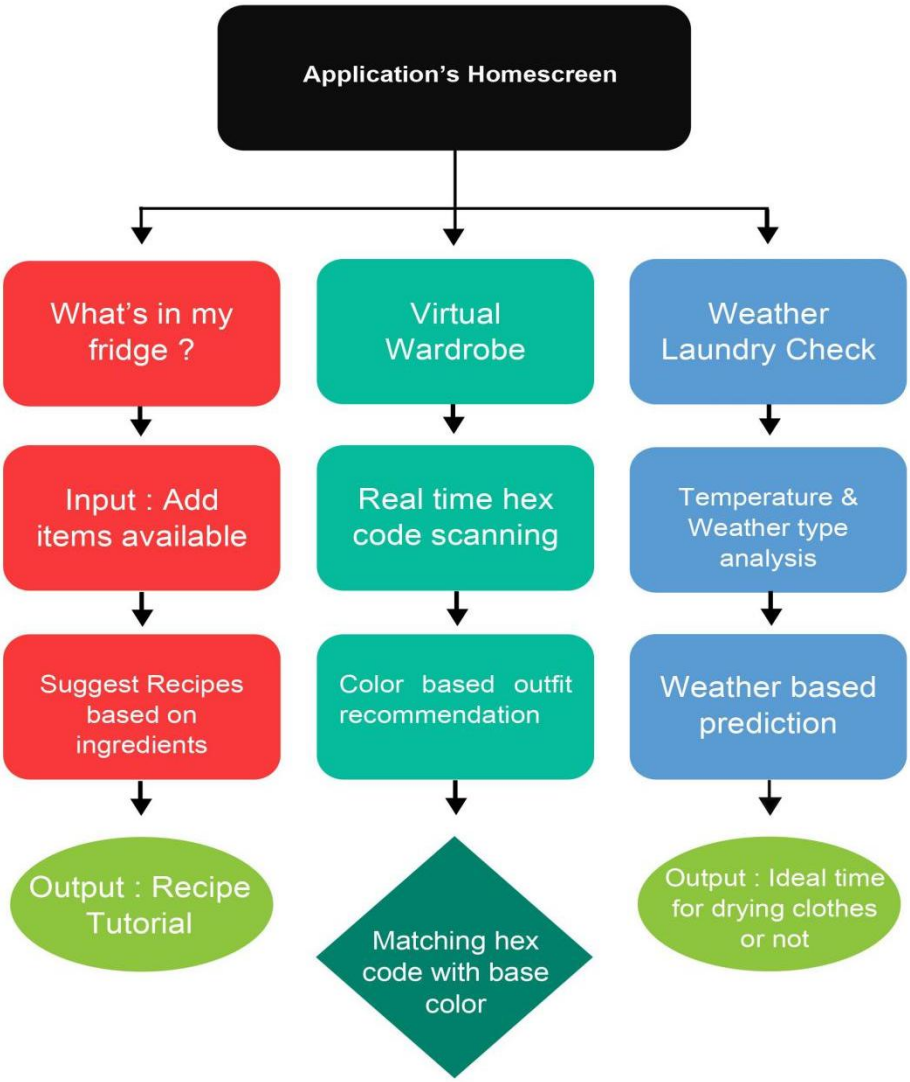

Fig 4 : Categorization of techniques used

The flowchart in the figure.3 defines about the working of the application, as soon the application is opened by the user it ask for permission of location (for weather purpose) and media permission (for adding pictures of the dresses in the application), if the permission is granted the application is loaded and the home-screen is opened, in case if the user decline the permission the application is aborted. The home-screen is about the menu present in the application by which different operations can be performed and in case of back button press the application go back to the home-screen. In the home-screen of the application if the back button is pressed, the application exits and all the foreground processes are terminated.

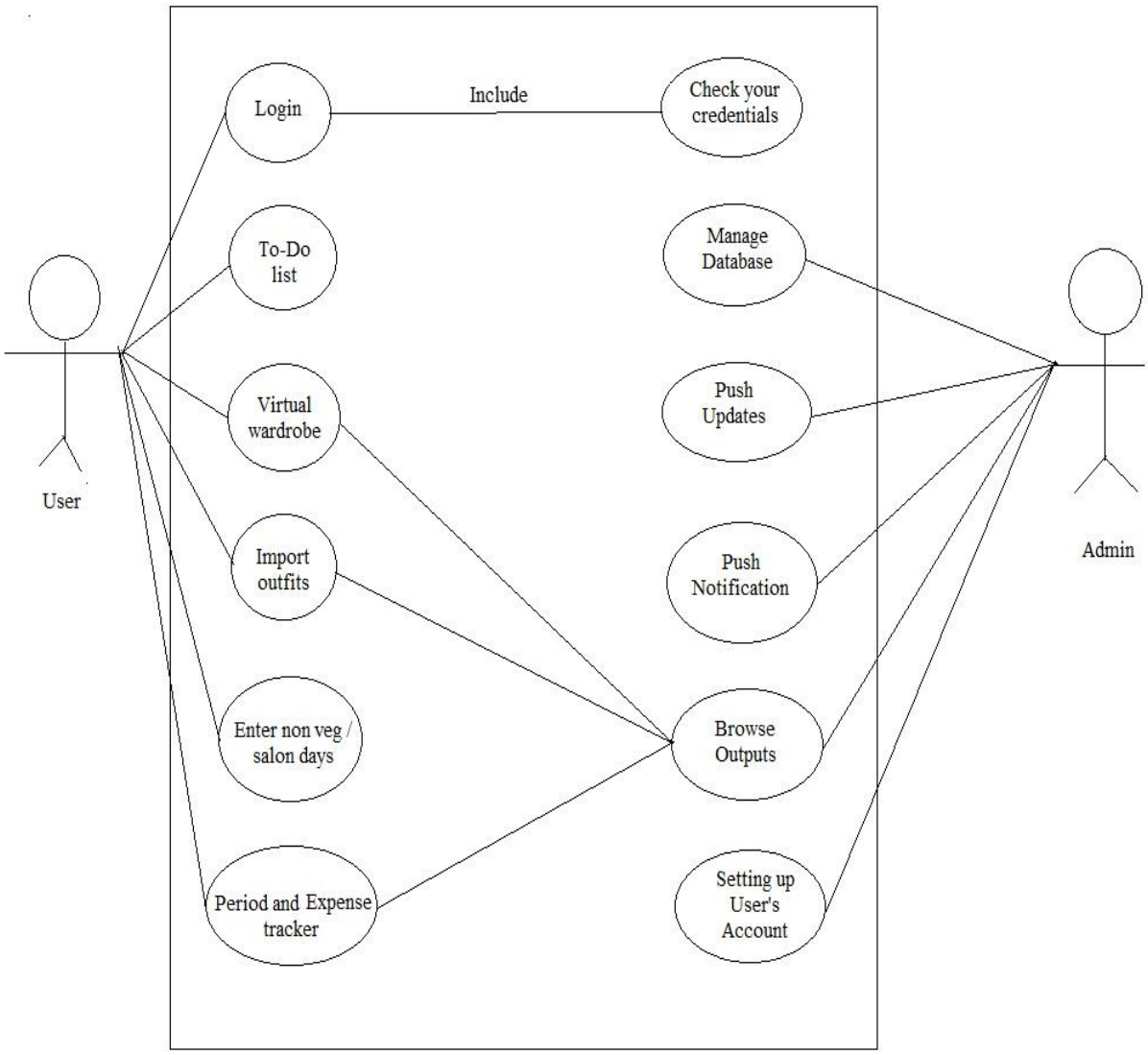

Fig-5Use Case Diagram

In the above figure.5 some features of the app gets ready for first time use after taking some input from the user. For setting up user's account the user will need to add pictures of their clothes into different categories by either uploading it via file browser or by clicking it by the in-built camera of the application. Female users will need to enter their last menstrual cycle details for using the periods tracking feature of the app. As well as in the routine, to do list and call your loved ones option the user will have to enter details for making the use of it.

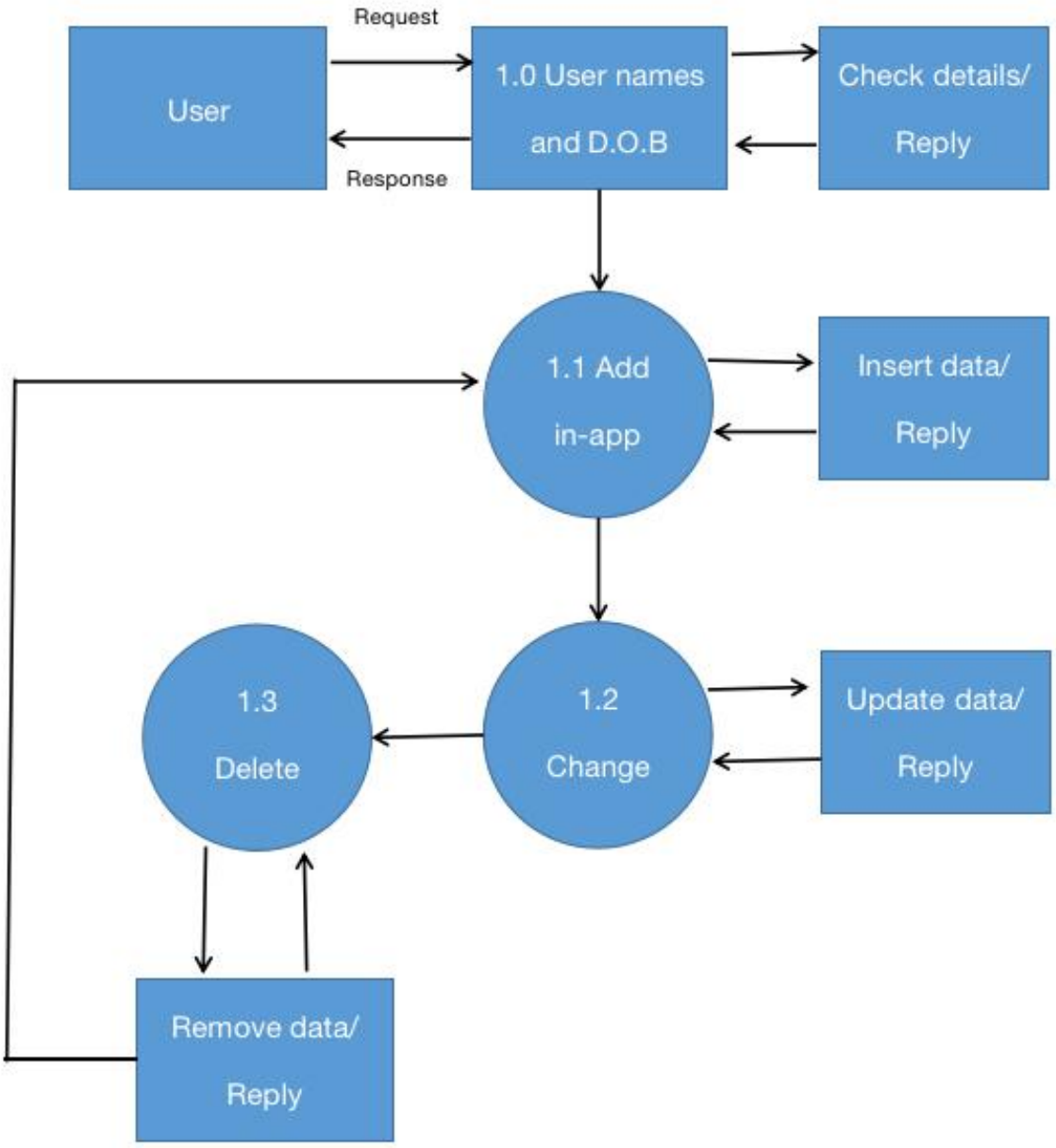

Fig-6Data Flow Diagram

In the figure.6, this data flow diagram shows the data management of the application as for setting up the user's account the user will have to enter their name, date of birth and gender. For better user interface the application also allows you to upload your avatar, in which the user can select any vector from the in-built options or can upload their picture by picking it from gallery or file browser. The data can be changed and edited by going to the account section. All the received data is stored locally on the device directory.

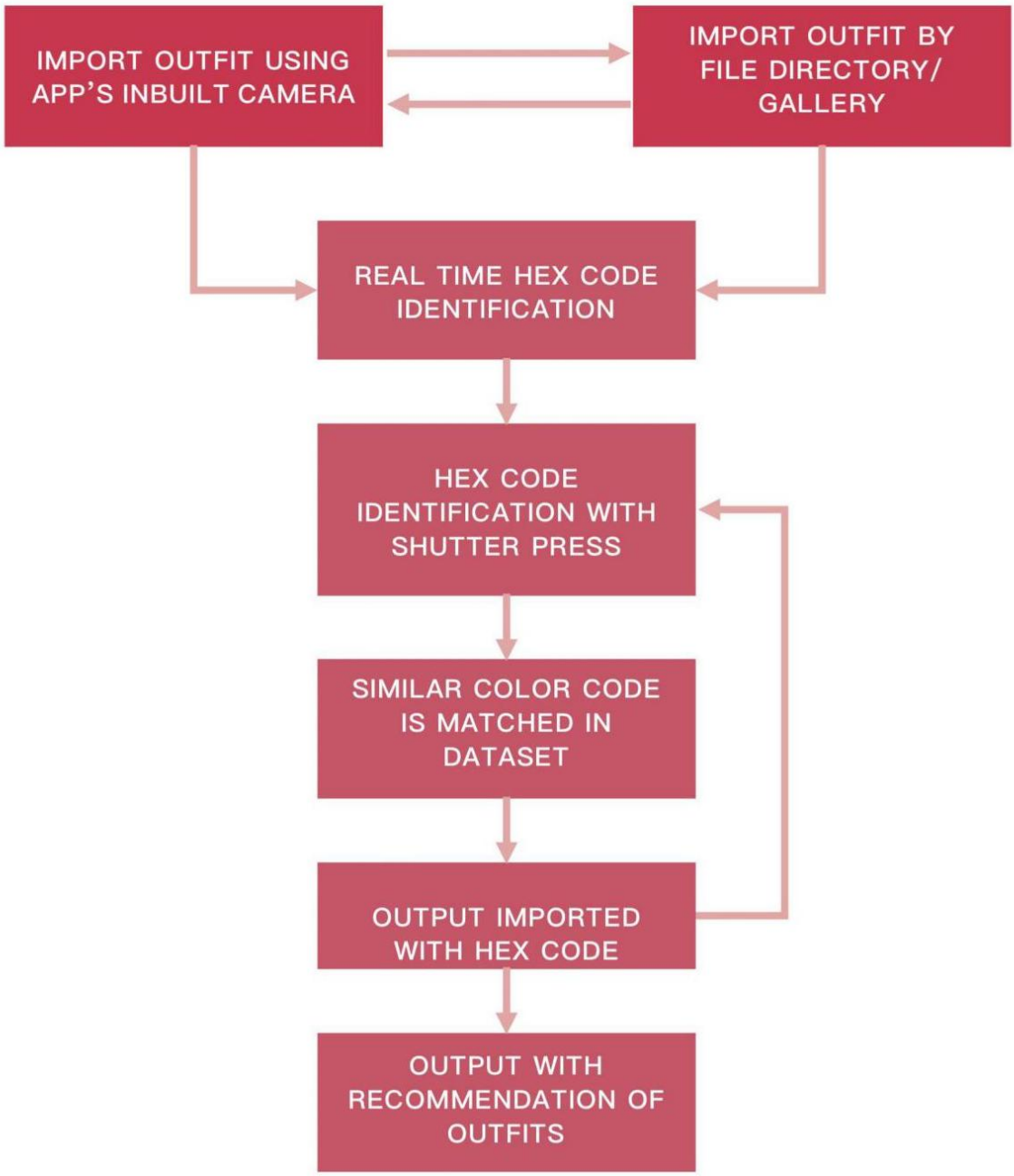

Fig-7Virtual Wardrobe Activity Diagram

Virtual wardrobe is one of the main feature of this application and in the above activity diagram of virtual wardrobe the very first thing is importing the image of the clothes in proper lighting condition, as in poor lighting conditions the color can be changed and can cause improper suggestions output to the user. Once the image is added, it needs to be

categorized in any of the one category which are : Formal, Casual and Ethnic. Once the image is imported in the application, the major color used in the cloth is picked and the color is identified using the Artificial Intelligence. After that the base color data is stored in the application's internal local database. Now on different days according to the day wise data-set, the recommendation of the app is built which comes under the decision stage. After it when the user visit's the virtual wardrobe section, the outfit suggestion is shown to the user.

3.4 Testing Process

Software Testing :

Introduction : - Software testing is a vital part as it ensures and assures the developer that the developed software is free from bugs and loopholes. During this process, the debuggers investigates each and every part of the software, after diagnosing the bug the debuggers troubleshoot and fix the problems. The main purpose of software testing it to maintain product's quality in which it is intended to use. Software testing ensures the app is free from errors, crashes, unresponsive buttons and printing wrong output to the user.

Unit Testing : In this, all the modules are independently evaluated. Here module can be either individual or a method. Unit testing allows to check for all the modules of the software that has a function to perform. We tested all functional key of 'Being a human' app and this assured that all clickable buttons are responsive and also in-app navigating buttons are working properly.

Integration Testing : In this testing method, related components are merged and analyzed during integration planning. Here combination of different units are checked along with their interactions. This testing method is used for checking for all integrated elements of the application such as application programming interface, login/ signup pages.

Validation Testing : This testing method is used to identify that the software matches its given objectives, also matching the standard of specified specifications. This testing method helps in identifying that the product actually matches client's requirements and needs or not.

GUI Testing : GUI testing refers to user interface testing. This ensures that the user interface is friendly with the user and all elements on the screen are well synced. Animations, icons and in app images are being tested in GUI testing.

Test Cases :

Use Case ID	1
Test Case Name	Scan colour hex code in real time
Test Case Description	Correct hex code must be detected for accurate result in outfit recommendation system
Steps	3 Grant camera permission and open in application's camera 4 Click shutter button for fetching hex code of the colour of the outfit. 5 Hex code being saved in the database.
Actual Result	As expected

Table 3.4.1

In the above table 3.4.1, test case of first test is shown. In the first test we tested the application's feature of scanning hex code of the cloth's color and the results were as expected. The last objective of this activity for being successful was to successfully scan for the hex code being used in the cloth, then to figure out the base color and in the last to save the scanned hex code along with it's base color in the backend.

Use Case ID	2
Test Case Name	Result of outfit recommendation system
Test Case Description	Day wise recommended colour based output should be given by the outfit recommendationsystem.
Steps	1. Open virtual wardrobe section of the app 2. Open desired drawer. 3. Find outfit of the day suggestions.
Actual Result	As expected

Table 3.4.2

In the above table 3.4.2, we tested for the accuracy of the result/output given by the application's feature named 'Outfit recommendation system' which is a sub category of the feature 'Virtual wardrobe', here the final objective was to cross check for the colors of the outfit being matched with the day wise recommended color.

Use Case ID	3
Test Case Name	Ingredient based recipes recommendation
Test Case Description	Correct recipes should be suggested based on

	theingredients matching condition.
Steps	1. Open what's in my fridge section. 2. Add one dairy product and two vegetables. 3. Check for recipes recommendations.
Actual Result	As expected

Table 3.4.3

In this above table 3.4.3, test case of the third test is shown in which result/suggestion of the application's feature named 'What's in my fridge' is being checked. The final objective was correct suggestion of recipes to the user based on the added or present ingredients in the fridge manager section.

Code for real time colour identification :

```
// $colors = array(
//     "black"     => array(0, 0, 0),
//     "black"     => array(7, 7, 7),
//     "black"     => array(15, 15, 15),
//     "black"     => array(18, 17, 17),
//     "black"     => array(24, 20, 20),
//     "black"     => array(16, 12, 12),
//     "black"     => array(27, 26, 26),
//     "black"     => array(10, 7, 7),
//     "black"     => array(11, 1, 1),
//     "black"     => array(10, 5, 5),
//     "black"     => array(31, 31, 31),
//     "black"     => array(9, 5, 5),
// );
$colors       =
  array(   "000
  000"       =>
  "black",
  "070707"
  =>   "black",
  "0F0F0F"
  =>   "black",
  "121111"
  => "black",
  "181414" =>
  "black",
  "100C0C"
  => "black",
  "1B1A1A"
  => "black",
```

```
   "0A0707"
   => "black",
   "0B0101"
   => "black",

"0A0505" =>
"black",
"050000" =>
"black",
"1F1F1F" =>
"black",
"090505" =>
"black",
 );
 $value =
 $_REQUEST['hex_color'];
 function html2rgb($color)
 {
    if ($color[0] == '#')
       $color = substr($color, 1);

    if (strlen($color) == 6)
       list($r, $g, $b) = array($color[0].$color[1],
                                $color[2].$color[3],
                                $color[4].$co
    lor[5]);
elseif (strlen($color) == 3)
                                  list($r, $g, $b) =
                  array($color[0].$color[0],
  $color[1].$color[1],  $color[2].$color[2]);
    else
       return false;
$r = hexdec($r); $g = hexdec($g); $b = hexdec($b);return array($r, $g, $b);}
```

```
function distancel2(array $color1, array $color2)
    {return sqrt(pow($color1[0] - $color2[0], 2) +
        pow($color1[1] - $color2[1],
        2) +pow($color1[2] -
        $color2[2], 2));
}
```

Only black colour is shown in this sample code, as the whole code of all colours are very big. Thecolour picker works like first the colour code is picked from the inbuilt camera of the app, the pointer area keeps on fetching similar colour hex codes, as soon as the shutter button is pressed,the hex code is captured and saved in the backend which is later used by recommendation system. The condition of base colours according to day wise is given below :

```
if(dayOfTheWeek.equals("Monday")){
    todays_color_sql = "color = 'white'";
} else if(dayOfTheWeek.equals("Tuesday")){
    todays_color_sql = "color = 'red'";
} else if(dayOfTheWeek.equals("Wednesday")){
    todays_color_sql = "color = 'green'";
} else if(dayOfTheWeek.equals("Thursday")){
    todays_color_sql = "color = 'yellow'";
} else if(dayOfTheWeek.equals("Friday")){
    todays_color_sql = "color = 'blue' OR color = 'white'";
} else if(dayOfTheWeek.equals("Saturday")){
    todays_color_sql = "color = 'purple' OR color = 'black'";
} else if(dayOfTheWeek.equals("Sunday")){
    todays_color_sql = "color = 'pink'";
}
```

Fig 8 - Day wise code part

```
public class PeriodActivity extends AppCompatActivity
        implements NavigationView.OnNavigationItemSelectedListener {
    private final int[] calButtonIds = {R.id.cal01, R.id.cal02, R.id.cal03,
            R.id.cal04, R.id.cal05, R.id.cal06, R.id.cal07, R.id.cal08,
            R.id.cal09, R.id.cal10, R.id.cal11, R.id.cal12, R.id.cal13,
            R.id.cal14, R.id.cal15, R.id.cal16, R.id.cal17, R.id.cal18,
            R.id.cal19, R.id.cal20, R.id.cal21, R.id.cal22, R.id.cal23,
            R.id.cal24, R.id.cal25, R.id.cal26, R.id.cal27, R.id.cal28,
            R.id.cal29, R.id.cal30, R.id.cal31, R.id.cal32, R.id.cal33,
            R.id.cal34, R.id.cal35, R.id.cal36, R.id.cal37, R.id.cal38,
            R.id.cal39, R.id.cal40, R.id.cal41, R.id.cal42};
    private final int[] calButtonIds_2 = {R.id.cal01_2, R.id.cal02_2, R.id.cal03_2,
            R.id.cal04_2, R.id.cal05_2, R.id.cal06_2, R.id.cal07_2,
            R.id.cal08_2, R.id.cal09_2, R.id.cal10_2, R.id.cal11_2,
            R.id.cal12_2, R.id.cal13_2, R.id.cal14_2, R.id.cal15_2,
            R.id.cal16_2, R.id.cal17_2, R.id.cal18_2, R.id.cal19_2,
            R.id.cal20_2, R.id.cal21_2, R.id.cal22_2, R.id.cal23_2,
            R.id.cal24_2, R.id.cal25_2, R.id.cal26_2, R.id.cal27_2,
            R.id.cal28_2, R.id.cal29_2, R.id.cal30_2, R.id.cal31_2,
            R.id.cal32_2, R.id.cal33_2, R.id.cal34_2, R.id.cal35_2,
            R.id.cal36_2, R.id.cal37_2, R.id.cal38_2, R.id.cal39_2,
            R.id.cal40_2, R.id.cal41_2, R.id.cal42_2};

    private final String STATE_MONTH = "month";
    private final String STATE_YEAR = "year";
```

Fig 9- Period tracker code part

```
@SuppressLint("DefaultLocale")
public class PeriodicalDatabase {
    public final Integer DEFAULT_PERIOD_LENGTH = 5;
    public final Integer DEFAULT_LUTEAL_LENGTH = 14;
    public final Integer DEFAULT_CYCLE_LENGTH = 183;
    public final Integer DEFAULT_START_OF_WEEK = 0;
    public final Boolean DEFAULT_DIRECT_DETAILS = false;
    public final Boolean DEFAULT_SHOW_CYCLE = true;
```

Fig 10- Period cycle length default data code

```
BottomSheetBehavior bottomSheetBehavior;

String dayOfTheWeek;
Date d;
SimpleDateFormat sdf;
SharedPreferences preferences;

@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_salon);

    Window window = this.getWindow();
    View vieww = window.getDecorView();

    new WindowInsetsControllerCompat(window,vieww).setAppearanceLightStatusBars(true);

    day = findViewById(R.id.day);
    salon_icon = findViewById(R.id.salon_icon);
    day_desc = findViewById(R.id.day_desc);
    nearby_salons = findViewById(R.id.nearby_salons);
    back_button = findViewById(R.id.back_button);
    back_button.setOnClickListener(view -> onBackPressed());

    preferences = PreferenceManager.getDefaultSharedPreferences( context: this);
```

Fig 11 - Salon day code part

```
Uri gmmIntentUri = Uri.parse("geo:0,0?q=salons");
Intent mapIntent = new Intent(Intent.ACTION_VIEW, gmmIntentUri);
mapIntent.setPackage("com.google.android.apps.maps");

nearby_salons.setOnClickListener(view -> startActivity(mapIntent));
```

Fig 12 - Nearby salon’s direction code part

```
public void waterRemoveOnClick(View view) {
    currentAmount -= Math.round(containerSize);
    if(currentAmount <=0){
        currentAmount = 0;
    }
    waterProgressBar.setProgress((int)((currentAmount / goal) * 100));
    waterAmountText.setText(currentAmount + " Glasses / " + goal + " Glasses");
    if(currentAmount >= 8){
        waterGoalText.setText("Your daily water goal is completed ");
    }else {
        waterGoalText.setText("");
    }
    SharedPreferences.Editor edit = pref.edit();
    edit.putFloat("current_amount", currentAmount);
    edit.apply();

    java.util.Date utilDate = new java.util.Date();
    java.sql.Date date = new java.sql.Date(utilDate.getTime());
    Time time = new Time(utilDate.getTime());
    DatabaseHelper db = new DatabaseHelper( context: this);
    db.insertData(time, date, goal, currentAmount, containerSize);
}
```

Fig 13 - Water reminder code part

```
protected void addColorFromYUV420(byte[] data, int[] averageColor, int count, int x, int y, int
    final int Y = data[y * width + x] & 0xff;
    final int xby2 = x / 2;
    final int yby2 = y / 2;

    final float V = (float) (data[size + 2 * xby2 + yby2 * width] & 0xff) - 128.0f;
    final float U = (float) (data[size + 2 * xby2 + 1 + yby2 * width] & 0xff) - 128.0f;

    float Yf = 1.164f * ((float) Y) - 16.0f;
    int red = (int) (Yf + 1.596f * V);
    int green = (int) (Yf - 0.813f * V - 0.391f * U);
    int blue = (int) (Yf + 2.018f * U);

    red = red < 0 ? 0 : red > 255 ? 255 : red;
    green = green < 0 ? 0 : green > 255 ? 255 : green;
    blue = blue < 0 ? 0 : blue > 255 ? 255 : blue;

    averageColor[0] += (red - averageColor[0]) / count;
    averageColor[1] += (green - averageColor[1]) / count;
    averageColor[2] += (blue - averageColor[2]) / count;
}
```

Fig 14 - YUV to RGB conversion code part

Chapter 4: RESULTS / OUTPUTs

‘Being a human’ is a complete application every individual should have as it is a safe, secure and easy to use virtual manager of yours where you can save your data and recommendations is provided by the application. Features like virtual wardrobe, outfit recommender, and laundry check are unique and till date there’s no such app having these features. The features of the apps covers major lifestyle parts like assuring user’s water consumption, medicine routine, female menstrual cycle tracker, expense manager, virtual wardrobe, outfit recommender and fridge management. Combining features of multiple apps with some unique features too, this application can really enhance, ease and improve human’s lifestyle. Users can rely on this application and these features can really make their life easy. Users can use outfit recommendation system of the app for finding their outfit of the day, they can easily browse their wardrobe on their phone virtually. Virtual refrigerator management system allows users to be aware with the ingredients the user is having in its fridge and also the app suggest recipes based on the ingredients added by the user. To do list, routine organiser and expense tracker features can be used for keeping their data organized and also having their eye on their monthly expenses along with proper analytics. Female users can use period tracker feature of the app for tracking their menstrual cycle every month and also the app will send notification about days left in next period cycle and if it gets delayed. Water reminder feature aims to ensure water consumption of ‘being a human’ users, a floating notification will keep on reminding you for drinking a glass of water at regular intervals and once the goal of 8 glass of a day is completed, the floating notification disappears.

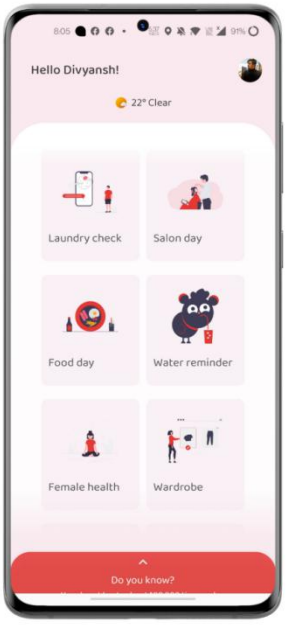

Fig 15: Application's home screen

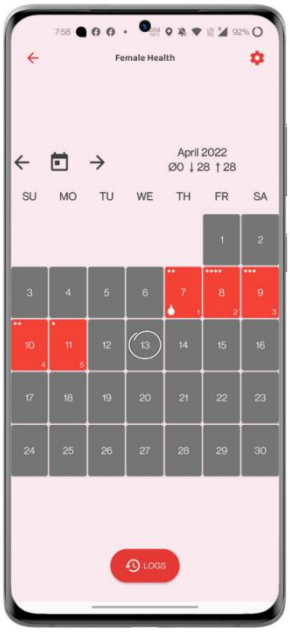

Fig 16: Period's tracker

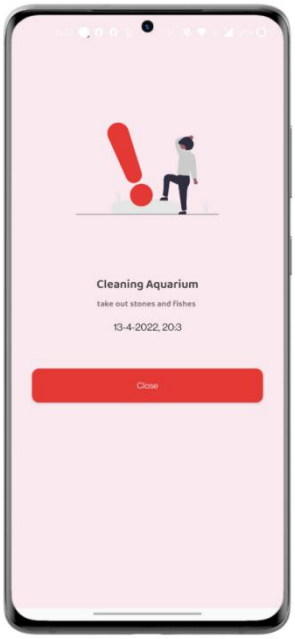

Fig 17: To Do List Reminders

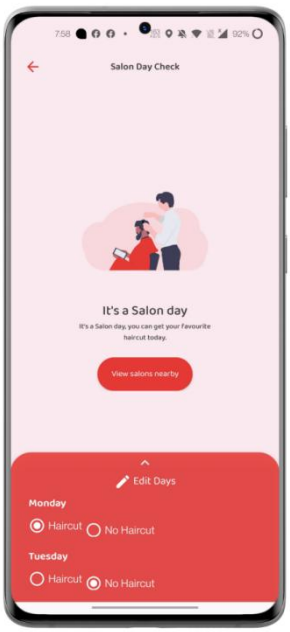

Fig 18: Salon Day & Nearby Salon Finder

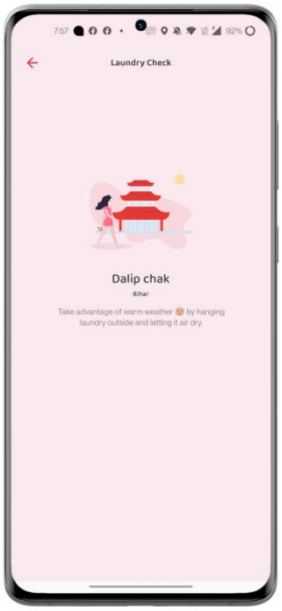

Fig 19: Laundry checker

Fig 20: Real time hex code

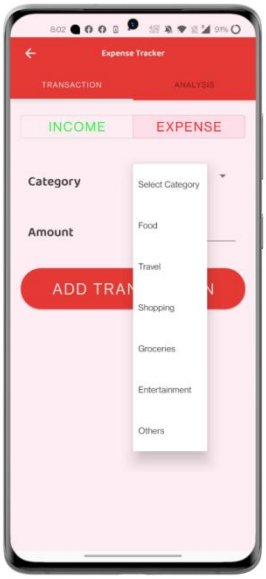

Fig 21: Expense tracker

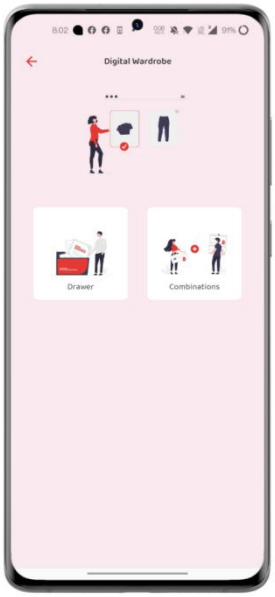

Fig 22: Virtual Wardrobe

Fig 23: Water tracker

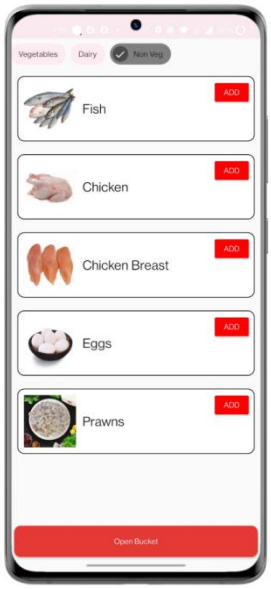

Fig 24: Fridge Manager

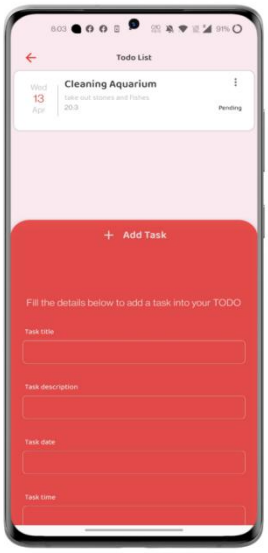

Fig 25: To do list

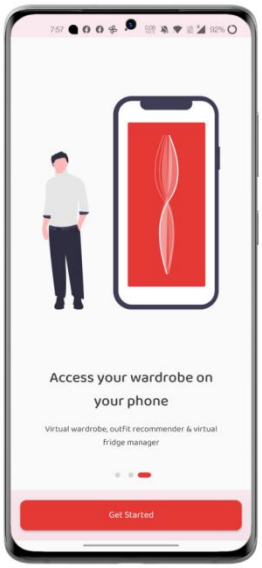

Fig 26: Intro Screenshot

Chapter 5: Conclusion

The application offers some unique features which aren't existing right now in terms of apps. Some features like to do list, female periods tracker and expense manager exist but the user will have to download different apps for each purpose. This application sort this problem out as it will include all the features in just one application. Also overall this application will be like a personal manager for every individual user as it will keep personal records and data of the user and the user can easily rely on the application. With time and in app surveys we will add more features in the application which will focus on improving, easing and enhancing user's lifestyle.

5.1 Further Improvement

Some changes in work-flow and algorithms will be done for making the app more responsive and smooth. After some in app surveys, we can add more options into the app. The suggest nearby restaurants and salons in Google maps, but in future it can be shown inside the application with allnavigation options and customer reviews. Features like virtual wardrobe, outfit recommender, what's in my fridge and laundry check are unique and till date there's no such app having these features. The features of the apps covers major lifestyle parts like assuring user's waterconsumption, medicine routine, female menstrual cycle tracker, expense manager, virtual wardrobe, outfit recommender and fridge management. Combining features of multiple apps with some unique features too, this application can really enhance, ease and improve human's lifestyle.In future, more features can be brought into the application by running in app surveys and discussion with the team members. In future family connecting features can be added which will let users allow seeing live location of their friends and family. Some other routine and lifestyle improving features can be added like in app meditation features, calming sounds and motivating podcasts

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